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ABSTRACT

A study examined the effect of extended use of computers on reading achievement. The study population consisted of 75 seventh-grade students at the J. N. Thorp Elementary School located in a predominantly low income socio-economic neighborhood of South Chicago. Of this total, 15 students were subjected to an intensive computer assisted instruction program, while 15 others, randomly selected from the remaining group of 60, received no computer training and served as a control group. The reading subtest of the Iowa Tests of Basic Skills served as the pre- and posttest. Results indicated a statistically significant increase in reading achievement of the students who used computers. (One table of data is included; 13 references are attached.) (RS)

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Almost every school in the Chicago Public System has a computer program. Students are receiving some type of computer assisted instruction (CAI) whether its a pull-out or other type of program. Many of the Chapter 1 labs have concentrated on one subject area only. The labs are reading labs, math labs or writing labs. The pull-out programs have their limitations, and sometimes students may be even turned off by constant drill and practice work on the computers. Extensive computer instruction (ECI) in a homeroom situation provides students with a varied and extensive use of computers. Students are able to use computers in all subject areas and can decide how best the computer can serve and be of assistance to them. Parents, local school councils, school administrators should become aware of the varied uses of computers and implement them in every classroom.

The question if schools should use computers no longer exists. It is a technological must. Given the proper information, educators can make the appropriate decisions about what type of computer programs need to be implemented

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at their schools. Teachers must be willing to take control of this tool and use it to their advantage, only when this occurs will the students benefit the most.

Review of Literature

Today's teachers are presented with the emergence of a relatively new classroom teaching tool--computers. Although the first device containing the essential processes of a computer was designed in 1835 by Charles Babbage it was not until 1977 that computers entered the nation's schools (Hoffmeister, 1984; Shalaway, 1980) Today, approximately one million of the nation's schools are incorporating CAI in the curriculum (Abrams, 1986) Many schools are training teachers to be computer literate, yet there appears to be virtually no training concerning the effective use of computers as an educational tool (Caruso, 1984). As educators are faced with the surge of computers in the classroom, effective computer usage in reading instruction becomes of primary importance.

Hundreds of studies attribute gains in standardized test scores and other improvements to the use of integrated instructional systems-custom packages of computers, data storage devices, and instructional software. According to Mark Sherry the director of Educational Products Information Exchange (EPIE) Institute the study they conducted says'its researchers avoided looking at quantitative studies because

so few were good. Instead they conducted a qualitative study of 11 integrated systems, examining instructional and management software and interviewing teachers, students, lab managers, computer coordinators, and school administrators. The resulting 427 page "Integrated Instructional Systems Report" contains evaluations and comparative ratings of specific integrated systems. Most school districts EPIE visited were pleased with the integrated systems. Nearly two-thirds of teachers and administrators called them highly effective, and 96 percent said they would recommend their system to another school. 98 percent of the students shared the same recommendation.

John Kerman, president of Jostens Learning Corporation, suggests that schools should mix and match- buying an integrated system for the basics of the curriculum and independent software extras (Trotter, 1992).

There is evidence of class-, race-, and gender-based differences in computer use. (Apple, 1992) In middle-class schools, the number of computers is considerably more than in working-class or inner-city schools populated by children of color. Economically advantaged schools not only have more contact hours and more technical support, but the very manner in which the computer is used is often different from what would be generally found in less-advantaged schools.

Gender differences are also very visible (Apple, 1992). Two out of every three students currently learning about computers are boys. Even these data are deceptive, since girls tend to be clustered the general introductory courses, not more advanced ones.

Class, race and gender impact will also occur because of practices such as tracking or streaming. Vocational and business tracks will learn word-processing skills and be primarily filled with young women. Academic tracks will stress general programming abilities and uses and be disproportionately male. While many teachers and curriculum workers have devoted considerable time and effort to equalize opportunities and outcomes of females in mathematics and science, where curricula already contribute to the reproduction of gender differences, the problem still remains and can be worsened by computerization of these subjects.

Robyler (1992) using meta-analysis on thirty-eight published and unpublished studies and forty-eight dissertations found that computer applications had a statistically significant positive effect ($p < .05$) in a majority of the areas examined. However, the results must be interpreted cautiously until more studies of similar types and with similar reporting styles are available to confirm or deny these trends. The effect of computer applications on certain content areas seemed to have

slightly greater effect with mathematics than with reading/language skills, but this difference was not statistically significant. Using computers to teach cognitive skills such as critical thinking had an overall effect for reading. This study seems to suggest that computer-based instruction is potentially effective in most educational applications.

Wepner (1989) after doing an extensive study on reading software along with individual case studies concluded that the computer's ability to combine sound reading practices with non-threatening, humanistic feedback in a pleasingly structured environment makes it ideal for students with reading problems. When used with a discerning eye, the computer can become a "natural" part of any reading classroom for students with reading difficulties.

Schaudt (1987) conducted a study in the use of computers in a direct instruction reading lesson. Computer- assisted instruction has the potential to be an effective tool in helping students master targeted reading skills if time is allocated on the computer for sufficient and continuous content coverage, performance is monitored, and the teacher chooses software appropriate for the students' ability levels. Pearson (1985) suggested a new model of teaching in which the teacher assumes a more central and active role in instruction. This role is highlighted with the teacher helping the student to gradually move toward total

responsibility of skill acquisition. The use of CAI within direct instruction has the potential to help students make this gradual acquisition. It may also serve to increase student motivation to learn, to enhance the monitoring of student progress, and to free the teacher to provide more contact with individual students. Computer-assisted instruction presents a feasible tool for increasing teacher effectiveness.

Warren and Rosebery (1988) found that use of CAI resulted in marked improvements in both speed and accuracy of isolated word and pseudoword decoding. Students showed overall gains in pronunciation speed, the greatest gains being for the most difficult test items. Students overall accuracy for words and pseudowords also improved, from 73% on the pretest to 87% on the posttest . Warren and Rosebery also found that the computer can play an important role in contextualizing reading instruction, provided it is not viewed as an autonomous agent of change. Its potential as a tool for reading instruction depends on the quality of its design (e.g. the psychological and pedagogical underpinnings) and on the nature of the contexts in which it is used.

Question of the Study

What is the effect of extended use of computers on reading achievement?

Procedures

Population

The population of this study will include 75 seventh grade students. the students attend the J. N. Thorp Elementary School which is located in a predominantly low income socio-economic neighborhood in Chicago's South Chicago area. The population is comprised of 100% minority students.

Sample

From the 75 seventh grade students, there are 15 seventh grade students in my classroom who receive extensive computer instruction throughout the school year. Sixty students did not receive the program. Fifteen students were randomly selected from this sub-population.

Method of Data Collection

Every year students who are in the first through eighth grades in a Chicago Public School are administered the Iowa Tests of Basic Skills (ITBS). Two samples were utilized from those students who were involved in an extensive use of computers and those who were not. The reading scores of the ITBS administered in the Spring of 1991 and 1992 school years will be used in this study. The pretest-posttest group design will be utilized.

Treatment of Data:

The finding will be tabulated in terms of means and standard deviations. The t test will be utilized at the .05 level of confidence to determine if there is any statistically significant difference between the mean scores.

Findings of the Study

The samples for the study included seventh grade students from the J. N. Thorp Elementary School. Every year students are given the Iowa Tests of Basic Skills (ITBS). From these seventh grade students, two groups were randomly selected. Subjects in one group were given a program which consisted of an intensive use of computers while subjects in the other group were not given the program. Results from the 1991 ITBS reading subtest were used as a pretest and results from the 1992 ITBS reading subtest was used as a posttest. A t test ($p > .05$) for independent samples was done on these four sets of scores to determine if there was a statistically significant change in reading achievement after being subjected to the intensive use of computers program. Table I summarizes the statistical analyses.

Table I

Means, Standard Deviations, and t Tests for the Experiemental Group and Control for Reading Achievement Scores

Reading (N=15)

Test	Experimental	Control	t
Pretest			
M	5.3	5.2	0.307
SD	0.987	0.792	
Posttest			
M	6.5	5.8	3.5*
SD	0.464	0.791	

df= 28 p> .05

* Significant at the .05 level

Analysis of the 1991 mean pretest scores suggest that the Experimental group and Control group were not significantly different at the beginning: the E-group with a mean of 5.3 and the C-group with a mean of 5.2. This result and other information about the E-group and C-group which is presented (see Table 1) allows the conclusion that the two groups were not equal in reading achievement in the Spring of 1992.

A review of the 1992 mean posttest scores points out that after one year of exposure to extensive computer usage the C-group's mean achievement score in reading was 5.8 while the E-group's mean in reading was 6.5. Therefore, there is a

statistically significant increase in reading achievement of the E-group.

The t scores for the 1991 results (0.307) and 1992 results (3.5) show a significant change in reading scores for the two groups.

Generally, the data leads to the acceptance of the operational hypothesis: seventh grade students taught reading using computers extensively will obtain significantly higher reading scores than those students in the regular classrooms.

In this study more research is needed as the use of CAI within direct instruction is showing potential to help the student make the gradual transition toward total responsibility of skill acquisition. It may also serve to increase student motivation to learn, to enhance the monitoring of student progress, and to free the teacher to provide more contact with individual students. Computer-assisted instruction presents a feasible tool for augmenting teacher effectiveness.

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